Small Business Innovation Research/Small Business Tech Transfer

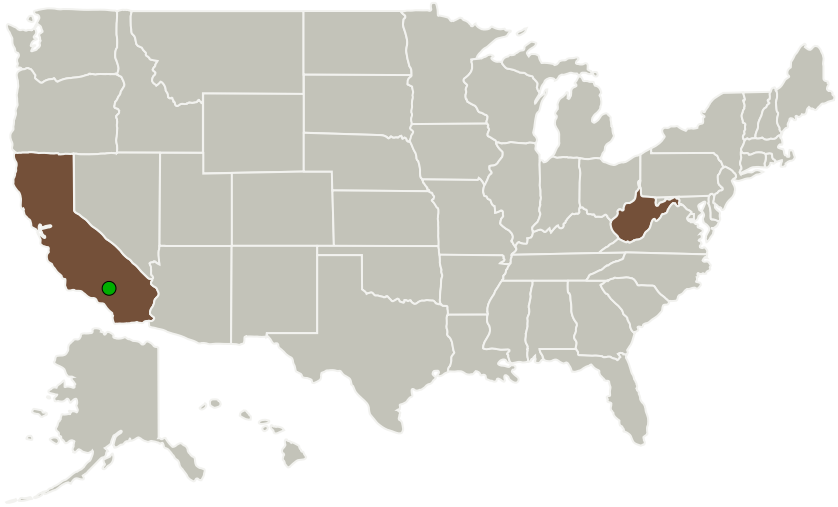
Portable Virtual Aircraft Test System (PVATS), Phase I

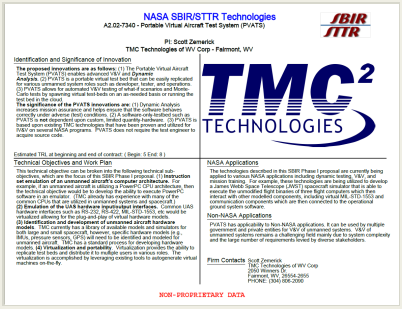
Completed Technology Project (2017 - 2017)

Project Introduction

TMC's reusable modeling and simulation technologies are currently utilized by NASA for enabling advanced verification and validation (V&V) and dynamic analysis of complex systems such as spacecraft and launch vehicles by executing the exact flight software binaries in a software-only test bed. These reusable technologies, already developed under a NASA contract, are also applicable to unmanned aircraft systems (UAS) and will provide a portable, faster-than-real-time test bed capable of dynamic analysis, fault injection, and automated testing, including Monte Carlo analysis. This test bed, named Portable Virtual Aircraft Test System (PVATS), leverages TMC's existing virtualization and modeling technologies to create a virtual environment that includes a CPU instruction set emulator and modeled UAS components such as sensors and actuators, and which executes in an automated virtual machine. The PVATS goals are to directly improve the timeliness and thoroughness of test and evaluation outcomes while reducing costs and increasing UAS flight software assurance. The three targeted goals are 1) V&V of UAS flight software, 2) Assist UAS software development and early testing by providing many portable virtual test environments to developers, and 3) Training of UAS operators using a virtual environment.

Primary U.S. Work Locations and Key Partners





Portable Virtual Aircraft Test System (PVATS), Phase I Briefing Chart Image

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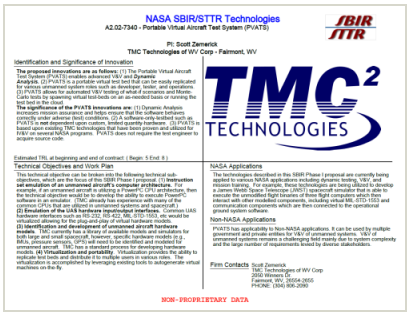
Organizations Performing Work	Role	Type	Location
TMC Technologies of WV Corporation	Lead Organization	Industry Historically Underutilized Business Zones (HUBZones)	Fairmont, West Virginia
Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations	
California	West Virginia

Images



Briefing Chart Image
Portable Virtual Aircraft Test System (PVATS), Phase I Briefing Chart Image *(https://techport.nasa.gov/image/132239)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
TMC Technologies of WV Corporation

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

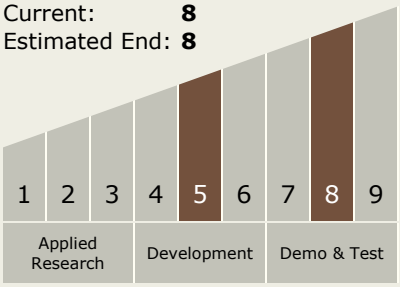
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Scott A Zemerick

Technology Maturity (TRL)

Start: **5**
Current: **8**
Estimated End: **8**



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Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.1 Software Development, Engineering, and Integrity
    - TX11.1.2 Verification and Validation of Software systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System